

Serial No.: 08/873,978
Filed: 12 June 1997

In the Claims:

Please cancel claims 33, and 36-46 without prejudice or disclaimer.

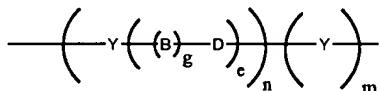
Please add the following new claims:

Sub B1
--47. A conductive oligomer with an ethyl-pyridine protected sulfur atom.

48. A conductive oligomer with a trimethylsilylethyl protected sulfur atom.

49. ~~A composition comprising a conductive oligomer covalently attached to a nucleoside.~~

Sub B2
50. A composition according to claim 49 wherein said conductive oligomer has the formula:



wherein

Y is an aromatic group;

n is an integer from 1 to 50;

g is either 1 or zero;

e is an integer from zero to 10; and

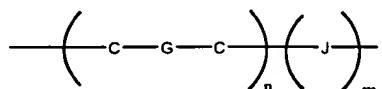
m is zero or 1;

Amended
wherein when g is 1, B-D is a conjugated bond selected from $-\text{C}\equiv\text{C}-$, $-\text{CH}=\text{CH}-$, $-\text{CR}=\text{CR}-$, $-\text{CH}=\text{CR}-$, $-\text{CR}=\text{CH}-$, $-\text{NH}-\text{CO}-$, $-\text{NR}-\text{CO}-$, $-\text{CO}-\text{NH}-$, $-\text{CO}-\text{NR}-$, $-\text{N}=\text{N}-$, $-\text{CO}-\text{O}-$, $-\text{O}-\text{CO}-$, $-\text{CS}-\text{O}-$, $-\text{O}-\text{CS}-$, $-\text{CH}=\text{N}-$, $-\text{CR}=\text{N}-$, $-\text{N}=\text{CH}-$ and $-\text{N}=\text{CR}-$, $-\text{SiH}=\text{SiH}-$, $-\text{SiR}=\text{SiH}-$, $-\text{SiR}=\text{SiH}-$, $-\text{SiR}=\text{SiR}-$, $-\text{SiH}=\text{CH}-$, $-\text{SiR}=\text{CH}-$, $-\text{SiH}=\text{CR}-$, $-\text{SiR}=\text{CR}-$, $-\text{CH}=\text{SiH}-$, $-\text{CR}=\text{SiH}-$, $-\text{CH}=\text{SiR}-$, $-\text{CR}=\text{SiR}-$, wherein R is a substitution group selected from alkyl, alcohol, aromatic, amino, amido, nitro, ether, ester, aldehyde, sulfonyl, silicon moiety, halogen, sulfur containing moiety, phosphorus containing moiety, and ethylene glycol; and

Serial No.: 08/873,978
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wherein when g is zero, e is 1 and D is preferably carbonyl, or a heteroatom moiety, wherein the heteroatom is selected from oxygen, sulfur, nitrogen or phosphorus.

51. A composition according to claim 49 wherein said conductive oligomer has the formula:



wherein

n is an integer from 1 to 50;

m is 0 or 1;

C is carbon;

J is carbonyl or a heteroatom moiety, wherein the heteroatom is selected from the group consisting of nitrogen, silicon, phosphorus, sulfur; and

G is a bond selected from single, double or triple bonds, wherein when G is a single bond, two R groups are attached to each C, and when G is a double bond, one R group is attached to each C, wherein R is a substitution group selected from hydrogen, alkyl, alcohol, aromatic, amino, amido, nitro, ether, ester, aldehyde, sulfonyl, silicon moiety, halogen, sulfur containing moiety, phosphorus containing moiety, and ethylene glycol.

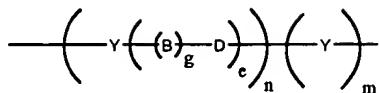
52. A composition according to claim 49 wherein said nucleoside is part of a nucleic acid.

53. A composition according to claim 49 further comprising a covalently attached electron transfer moiety (ETM).

54. A composition comprising a conductive oligomer covalently attached to a phosphoramidite nucleoside.

55. A composition according to claim 52 wherein said conductive oligomer has the formula:

Serial No.: 08/873,978
Filed: 12 June 1997



wherein

Y is an aromatic group;

n is an integer from 1 to 50;

g is either 1 or zero;

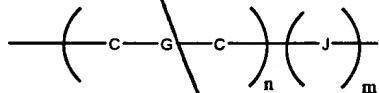
e is an integer from zero to 10; and

m is zero or 1;

wherein when g is 1, B-D is a conjugated bond; selected from $-\text{C}\equiv\text{C}-$, $-\text{CH}=\text{CH}-$, $-\text{CR}=\text{CR}-$, $-\text{CH}=\text{CR}-$, $-\text{CR}=\text{CH}-$, $-\text{NH}-\text{CO}-$, $-\text{NR}-\text{CO}-$, $-\text{CO}-\text{NH}-$, $-\text{CO}-\text{NR}-$, $-\text{N}=\text{N}-$, $-\text{CO}-\text{O}-$, $-\text{O}-\text{CO}-$, $-\text{CS}-\text{O}-$, $-\text{O}-\text{CS}-$, $-\text{CH}=\text{N}-$, $-\text{CR}=\text{N}-$, $-\text{N}=\text{CH}-$ and $-\text{N}=\text{CR}-$, $-\text{SiH}=\text{SiH}-$, $-\text{SiR}=\text{SiH}-$, $-\text{SiR}=\text{SiH}-$, $-\text{SiR}=\text{SiR}-$, $-\text{SiH}=\text{CH}-$, $-\text{SiR}=\text{CH}-$, $-\text{SiH}=\text{CR}-$, $-\text{SiR}=\text{CR}-$, $-\text{CH}=\text{SiH}-$, $-\text{CR}=\text{SiH}-$, $-\text{CH}=\text{SiR}-$, $-\text{CR}=\text{SiR}-$, wherein R is a substitution group selected from alkyl, alcohol, aromatic, amino, amido, nitro, ether, ester, aldehyde, sulfonyl, silicon moiety, halogen, sulfur containing moiety, phosphorus containing moiety, and ethylene glycol; and wherein when g is zero, e is 1 and D is preferably carbonyl, or a heteroatom moiety, wherein the heteroatom is selected from oxygen, sulfur, nitrogen or phosphorus.

Amended

56. A composition according to claim 52 wherein said conductive oligomer has the formula:



wherein

n is an integer from 1 to 50;

m is 0 or 1;

C is carbon;

J is carbonyl or a heteroatom moiety, wherein the heteroatom is selected from the group consisting of nitrogen, silicon, phosphorus, sulfur; and

Serial No.: 08/873,978
Filed: 12 June 1997

G is a bond selected from single, double or triple bonds, wherein when G is a single bond, two R groups are attached to each C, and when G is a double bond, one R group is attached to each C, wherein R is a substitution group selected from hydrogen, alkyl, alcohol, aromatic, amino, amido, nitro, ether, ester, aldehyde, sulfonyl, silicon moiety, halogen, sulfur containing moiety, phosphorus containing moiety, and ethylene glycol.

Su 57. A composition comprising a conductive oligomer covalently attached to a CPG-nucleoside.

El 58. An electrode comprising:

- a) a monolayer comprising a passivation agent layer comprising conductive oligomers; and
- b) at least one nucleic acid covalently attached to said electrode with a spacer.

Alc 59. A composition according to claim 56 wherein said spacer is a conductive oligomer.

60. A composition according to claim 56 wherein said spacer is an insulator.

61. A composition according to claim 56 wherein said passivation agent layer further comprises insulators

Su 62. A composition comprising a phosphoramidite nucleoside covalently linked to a metallocene.

63. A composition according to claim 62 wherein said nucleoside comprises a ribose and said metallocene is covalently attached to the 2' position of said ribose.

64. A composition according to claim 62 wherein said metallocene is covalently attached to the base of said nucleoside.

65. A composition according to claim 62 wherein said metallocene is ferrocene.